

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1. (Currently amended) A method for recycling metals from swarf ~~in removing oil sticking on the surface of grinding, cutting debris of metal workpiece and recycling metal swarf, said method comprising the~~ steps of:

(1) providing a plurality of particles of said swarf having an oil adhering to said swarf as a surface layer;

(2) ~~(1) Shattering[[:]]~~ shattering said swarf into tiny particles[[:]] to have a particulate size ranging from 1 micron to 10 microns;

(3) ~~(2) Washing[[:]]~~ washing said swarf at least once in a washing tank and washing it by combining said swarf with a an alkaline washing solution [[:]] having a pH ranging from 10.5 to 11.5 to provide a mixture of swarf and said alkaline washing solution, said alkaline washing solution comprising:

(a) an aqueous alkali non-ionic surfactant that further comprises:

at least one polyethoxylated alkyl ether containing at least one hydrophobic alkyl ether chosen from the group of alkyl ethers having the formula $C_nH_{2n+1}(C_6H_4)(C_2H_4O)_m$ where n is an integer chosen from the group consisting of 8 and 9, and m is another integer from 7 to 12, as well as

at least one hydrophilic alkyl ether chosen from the group of alkyl ethers having the formula $(C_nH_{2n+1})O(C_2H_4O)_m$ where n is an integer from 11 to 15 and m is another integer from 7 to 12;

(b) at least one builder species chosen from the group consisting of sodium silicate, sodium tripolyphosphate and sodium carbonate and combinations thereof; builders and,

(c) a predetermined amount of water, said aqueous alkali non-ionic surfactant mainly involving further comprising at least one polyethoxylated alkyl species; [[:]]

(4) (3) Separating solid from liquid: separating a washed solid from said mixture of swarf and said alkaline the washing solution [[:]] to yield a substantially particulate-free washing solution, said washed solid comprising at least one reclaimable metal for recycling;

(5) (4) Drying[[:]] drying the said washed solid get in the step (3) and removing said dried washed solid for recycling;

(6) (5) Separating separating said oil from water: collecting the substantially particulate-free washing solution after washing by and removing the oil floated floating above an aqueous phase on the upper level of the alkaline washing solution [[:]] to yield a substantially oil-free substantially particulate-free washing solution; and,

(7) (6) Arranging and storing said substantially oil-free substantially particulate-free washing solution [[:]] collecting the washing solution finished oil removing and storing it properly[[:]] Characterized by said washing solution composed of aqueous alkali non ionic surfactant and

~~water, said aqueous alkali non ionic surfactant mainly involving
polyethoxylated alkyl .~~

Claim 2. (Canceled)

Claim 3. (Currently amended) The invention in accordance with claim 1, wherein the aqueous alkali non-ionic surfactant in said alkaline washing solution ~~are~~ comprises a plurality of polyethoxylated alkyl ethers including a polyethoxylene.

Claim 4. (Currently amended) The invention in accordance with claim 3, wherein said hydrophilic ~~polyethylene contain~~ polyethoxylene comprises said ethylene oxide in a range of about 9 moles to about 14 moles of ethylene oxide.

Claim 5. (Currently amended) The invention in accordance with claim 3, wherein said hydrophobic alkyl ethers contain ~~a one~~ a methyl group and a methylene group in the range of about 10 moles to about 14 moles of methylene group.

Claim 6. (Currently amended) The invention in accordance with claim 1, wherein ~~each liter of~~ said alkaline washing solution contains a concentration about 50 gums to about 200 gums of said aqueous alkali non-ionic surfactant of about 50 grams per liter to about 200 grams per liter .

Claim 7. (Currently amended) The invention in accordance with claim [[2]] 1, wherein said ~~builders~~ builder species in ~~each liter of~~ said alkaline washing solution ~~contains~~ are present as a concentration of sodium silicate ranging from about 5 ~~gums~~ grams per liter to about to 50 ~~gums~~ grams of sodium silicate per liter.

Claim 8. (Currently amended) The invention in accordance with claim [[2]] 1, wherein said ~~builders~~ builder species in ~~each liter of~~ said alkaline washing solution ~~contain~~ are present with a concentration about 1 gram to about 10 gram of sodium tripolyphosphate ranging from about 1 gram per liter to about 10 grams per liter.

Claim 9. (Currently amended) The invention in accordance with claim [[2]] 1, wherein said ~~builders~~ in ~~each liter of~~ said alkaline washing solution ~~contains~~ are present with a concentration of about 1 gram to about 50 grams of sodium carbonate ranging from about 1 gram per liter to about 50 grams per liter.

Claim 10. (Canceled)

Claim 11. (Currently amended) The invention in accordance with claim 1, wherein said aqueous non-ionic surfactant solution is preheated to a predetermined temperature ~~temperatures~~ ranging from about 45 degrees Celsius to about 60 ~~degree~~ degrees Celsius before ~~contacting~~ grinding said step 3 swarf.